

## P-3703 NT 05

UDEL P-3703 NT 05 is a special low color grade of polysulfone designed specifically to serve the needs of the fiber optic/optoelectronic industry. This grade offers light transmittance of 85-87% at 650, 850, 1300, and 1550 nm. This resin also has a high refractive index,  $n_D$ , of 1.635. Lenses made from P-3703 NT 05 can be thinner and lighter than functionally equivalent lenses made from other commercial optical resins such as acrylic or polycarbonate.

In addition to the desirable optical properties, this grade offers the high-performance engineering properties of polysulfone. These include high heat deflection temperature, good toughness, excellent resistance to oxidation and hydrolysis, and stable electrical properties. Polysulfone is highly resistant to mineral acids, alkali, and salt solutions. Some polar solvents, such as ketones, chlorinated hydrocarbons, and aromatic hydrocarbons, can cause stress cracking.

### Typical Properties of UDEL P-3703 NT 05 Resin

Property	ASTM Test Method	Typical Values <sup>(1)</sup>			
		U.S. Customary units		SI units	
		Value	Units	Value	Units
<b>Optical Properties</b>					
Refractive Index, $n_D$	D 542	1.635		1.635	
Abbe Value		23.3		23.3	
Light Transmittance <sup>(2)</sup>	D 1003	≥85	%	≥85	%
Haze <sup>(2)</sup>	D 1003	≤3.0	%	≤3.0	%
Yellowness Index <sup>(2)</sup>	D 1925	≤8.0		≤8.0	
<b>Mechanical</b>					
Tensile Strength	D 638	10.2	kpsi	70.3	MPa
Tensile Modulus	D 638	360	kpsi	2.48	GPa
Tensile Elongation at Break	D 638	50-100	%	50-100	%
Flexural Strength	D 790	15.4	kpsi	106.2	MPa
Flexural Modulus	D 790	390	kpsi	2.69	GPa
Tensile Impact Strength	D 1822	200	ft-lb/in <sup>2</sup>	420	kJ/m <sup>2</sup>
Impact Strength- Notched Izod	D 256	1.3	ft-lb/in	69	J/m
<b>Thermal</b>					
Heat Deflection Temperature, at 264 psi (1.8 MPa)	D 648	345	°F	174	°C
Coefficient of Thermal Expansion	D 696	31	ppm/°F	56	ppm/°C
<b>Electrical</b>					
Dielectric Strength	D 149	425	V/mil	17	kV/mm
Dielectric Constant, 60-10 <sup>6</sup> Hz	D 150	3.10-3.15		3.10-3.15	
Dissipation Factor, 60-10 <sup>6</sup> Hz	D 150	0.001-0.005		0.001-0.005	
Volume Resistivity	D 257	5 x 10 <sup>16</sup>	ohm-cm	5 x 10 <sup>16</sup>	ohm-cm
<b>General</b>					
Specific Gravity	D 792	1.24		1.24	
Water Absorption, 24 hours	D 570	0.30	%	0.30	%
Melt Flow, 343°C, 2.16 kg	D 1238	17	g/10 min	17	g/10 min
Mold Shrinkage	D 955	0.7	%	0.7	%

<sup>(1)</sup> Actual properties of individual batches will vary within specification limits.

<sup>(2)</sup> Specimen thickness 0.10 inch (2.5 mm)

### Drying

UDEL P-3703 NT 05 polysulfone must be dried before fabrication to avoid streaking, splaying, or bubbling. Pellets can be dried in a circulating hot air oven or in a dehumidified hopper dryer.

To oven dry, spread the pellets on trays to a 1-2 inch depth and dry for 3.5 hours at 275°F to 300°F (135°C to 149°C). Handle the dried resin carefully to prevent reabsorption of moisture from the atmosphere.

To hopper dry, use inlet air with a dew point of -25°F (-32°C) at a temperature of 275° to 300°F (135° to 149°C) and a residence time of 3.5 hours.

Avoid excessively long drying times, because resin color may darken.

### Injection Molding

UDEL P-3703 NT 05 resin can be readily injection molded on standard screw injection equipment. To preserve the low color of the resin, maintain the shot size between 50 and 75% of machine capacity. Stock temperature should generally be in the range of 620° to 650°F (327° to 343°C).

Minimum back pressure, about 50 psi (0.3 MPa), should be used to minimize shear heating. Screw speed should be set to 60 rpm or slower.

Mold temperatures of at least 250°F (121°C) are recommended. In the case of complex parts requiring long flow lengths or having thin cross sections, or where low residual stress levels are required, the mold temperatures should be 300°F to 325°F (149°C to 163°C).

Weld line strength of UDEL P-3703 NT 05 resin is generally excellent, but it is good design practice to avoid weld lines in areas known to be subject to high stress.

### Standard Packaging and Labeling

UDEL P-3703 NT 05 polysulfone resin is packaged in multiwall paper bags containing 55.115 pounds (25 kg) of material. Special packaging can be supplied upon request. Individual packages will be plainly marked with the product number, the color, the lot number, and the net weight.

### Precautionary Labeling

On the basis of the toxicological, physical, and chemical properties of UDEL P-3703 NT 05 polysulfone resin, labeling used on containers is as follows:

*Caution! Handling and/or processing this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose, and throat.*

### Product Safety and Emergency Service

For product safety information or a Material Safety Data Sheet on a product of Solvay Advanced Polymers

**1 (800) 621-4557**

**1 (770) 772-8880 outside of U.S.**

For information or help in an emergency such as a spill, leak, fire or explosion, call day or night:

Emergency Health Information

**1 (800) 621-4590**

**1 (770) 772-5177 outside of U.S.**

Emergency Spill Information

**CHEMTREC 1 (800) 424-9300**

**1 (703) 527-3887 outside of U.S.  
collect calls accepted**

### For Additional Information

Technical Service

**1 (800) 621-4557**

Customer Service

**1 (800) 848-9744**

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